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Tinbergen Institute Discussion Paper

Trade, Trust and Transaction Costs

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Trade, trust and transaction costs

Frank A.G. den Butter and Robert H.J. Mosch^{*}

Abstract

Transaction costs are a major reason why international trade flows are much smaller than traditional trade theory would suggest. Trust between trading partners lowers transaction costs and may therefore enhance trade. The empirical analysis of this paper shows that more trust leads to more trade so that part of the “mystery of missing trade” can be attributed to the lack of trust between trading partners, e.g. because of cultural differences and habits, or because of insufficient information on product quality and reliability. Our gravity equation estimates for 25 countries show that measures of both formal and of informal trust contribute to the explanation of bilateral trade flows. When we assume an increase in informal trust by one standard deviation, the combined effects of formal and informal trust may add up to a 90 to 150 percent change in bilateral trade, depending on the legal system. Moreover our estimation results suggest that the causal relation runs primarily from trust to trade, and that formal and informal trust are substitutes.

Keywords: trade, trust, transaction costs, gravity model, legal system

JEL-codes: F10, Z13, D23, K12

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Trade, trust and transaction costs

Frank A.G. den Butter and Robert H.J. Mosch*

Arrow (1973: 24): “*there is an element of trust in every transaction*”.

1 Introduction

There is the “mystery of the missing trade” (Trefler 1995, Davis et al. 1997). It refers to the gap between the volume of trade that would be optimal according to the standard neo-classical models of trade theory – based on the Heckscher-Ohlin-Vanek theorem which states that countries export abundant factors – and the actual volume of international trade. According to model calculations international trade should be much larger than it actually is. A major reason is that the traditional neo-classical models do not account for transaction costs in international trade. Eaton and Kortum (2002), for example, provide a framework that shows that international trade would rise to a fivefold level when physical distance and other trade barriers would not exist. The observation of the home bias in trade provides some further insights into this conundrum. Calculations by McCallum (1995) and Helliwell (1998), who control for “objective” variables like distance between countries, size of the country, geographical barriers, language (dis)similarity and trade policies, show that Canadian provinces are trading much more with each other than with US states, in the order of 12 to 20 times as much.

These calculations prove that transaction costs play a major role in limiting (international) trade flows. It is obvious that trade, which is in a broad sense an exchange of property rights, is not for free, but has its price. Transaction costs in trade do not only comprise traditional costs associated with transportation (distance), trade barriers, tariffs, etc. but also search costs, costs on gathering information of product quality and the reliability of the trading partner, legal costs, control costs and costs associated with international payments.

This paper provides an empirical investigation of the influence of trust as a specific part of transaction costs on international trade flows. Hence, the focus in this paper is not on physical distance, but on cultural and institutional distances. We believe that institutions and cultural values and norms are in themselves beneficial for trade within a specific region or between people belonging to a specific group, but can be disadvantageous for trade between regions and people with a different cultural background. They may be well suited to lower transaction costs for domestic trade, but can be seen as having negative externalities by increasing the transaction costs in international trade. In our opinion, trust problems are the source of this type of

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transaction costs. Trust problems relate to the contingent behaviour of (potential) trading partners: can they be trusted, or not, to be able (competence) and willing (intention) to perform in letter and spirit of the agreement, even when circumstances occur that make it favourable for B to deviate? In fact, enhancing trust between trading partners (nations) leads to a reduction of transaction costs, and therefore to an increase in trade and welfare.

We distinguish two types of mechanisms to mitigate the trust problem. The first mechanism is based on formal procedures, the second on informal ones. Our hypothesis is that both types of trust reduce important parts of transaction costs and may explain part of the actual size of international trade flows. The more trust, the less missing trade. In order to test this hypothesis, we use a gravity equation framework to which we add indicators for formal and informal trust. Both types of trust mechanisms appear to have a substantial influence on the volume of trade indeed.

The paper can be placed in the literature at a crossroad of different streams. It combines the idea of transaction costs from the New Institutional Economics (Williamson 1979, 1985) with the ideas about the influence of trust and social capital on the functioning of economic mechanisms (Coleman 1990, Putnam 1993, Fukuyama 1995, La Porta et al. 1997, Knack and Keefer 1997, Woolcock 1998, Dasgupta 1999, Zak and Knack 2001). The resulting hypotheses are tested with use of the gravity model in which there is surge of interest lately (Wei 1996, Portes and Rey 1999, Frankel and Rose 2002, Glick and Rose 2002, Rose 2002, Méltz 2002, Loungani et al. 2002, Rauch and Trindade 2002, etc).

The structure of the paper is as follows. Section 2 takes a closer look at the connection between trade, trust and transaction costs from a theoretical perspective and formulates several hypotheses. In section 3 these hypotheses are tested with use of a gravity model. After some initial regression result we test the robustness of these results by using alternative indicators of trust, by changing the reference period and by investigating the simultaneity in the relationship between trust and trade flows. Section 4 discusses the results and indicates the policy implications in the light of globalisation and the developments in information and communication technologies.

2 Theories on trade, trust and transaction costs

This section gives a theoretical perspective on the linkages between trade, transaction costs and trust. As noticed before, we regard trust problems as a major source for trade barriers and transaction costs. Greif sees trust problems as an inherent consequence of the character of sequentiality of most transactions and labels this as the fundamental problem of exchange: “one will not enter into an objectively profitable exchange relationship unless the other party can *ex-ante* commit to fulfil his contractual obligations *ex-post*” (Greif 2000: 254, original italics). In order to illustrate how trust problems can enhance transaction costs, we take a closer look at three types of transaction costs and then examine their link with trust.

Trade and transaction costs

The concept of transaction costs is a central theme in the New Institutional Economics (see Williamson (2000) for an overview of this field of research). Transaction costs can be defined as the friction costs that appear while pursuing the gains of trade.

Although an operational definition of transaction costs is difficult to give, studies that try to measure this concept indicate that transaction costs can be very large. Wallis and North (1986) find that 45 percent of the United States' GNP was devoted to the transaction sector in 1970. Klammer and McCloskey (1995) note that one quarter of the GDP is related to persuasion, i.e. talks to make "real production" possible. Van Dalen and Van Vuuren (2003) show that approximately 29 percent of the working population of the Netherlands had a job in the trading sector in 1997.

Three stages can be distinguished in a trade transaction: (i) contact, (ii) contract and (iii) control. All three stages bring about transaction costs.

In the *contact* phase of a potential transaction, the buyer is looking for information about his preferred product (price and quality), potential suppliers, or, when the product does not yet exist, which producer could invent and/or produce it for him. The seller is trying to find a buyer for his product through marketing activities.

Transaction costs come forth out the fact that information is not free, not complete and not easily accessible. Traders have to invest in search. Evidently, this search for information is more difficult when, in an international context, communication is blurred by differences in language, differences in ways of information distribution and differences in culture based business norms. Reduction of the transaction costs of contact involves a mechanism with two essential characteristics. Firstly, information about business opportunities must be spread to all members of the business community who might be interested to be informed. Secondly, it must be guaranteed that this information is of high quality, i.e. the information can be trusted to be relevant and true. The distribution of reliable information is a characteristic function of networks (Casson 1997). Mutual trust among the members of the network increases the quality of the information. Some empirical backing for this claim can be found in the studies of Rauch (2001) and Rauch and Trindade (2002) that point at the role of co-ethnic business networks in solving this problem of missing information about business opportunities. Ethnic (Chinese) networks seem to be more influential in bilateral trade on differentiated than homogeneous goods. Portes and Rey (1999) note the importance of the "geography of information", measured by e.g. telephone call traffic and multinational bank branches, in a study on bilateral cross-border equity flows. Combes et al. (2002) present empirical support for their claim that business and social networks help to reduce informational trade barriers in France.

The *contract* phase starts directly after the moment the potential trading partners have found each other and are inclined to make a deal. Here transaction costs are made in negotiating the terms of the contract. Parties have to decide on how to make a reasonable split-up of the expected rents of the transaction and what to write down in the contract. They should not aim to put all eventualities in the contract. It is costly to write out all details, it is useless because some arrangements cannot be verified by third parties (verification problems), it is impossible because many eventualities can not be foreseen (fundamental uncertainty) and it may have unwarranted side-effects in the form of growing distrust between the parties if one takes explicit account of everything that might go wrong. Contracting becomes even harder in an international context. Parties have to learn the particularities of the legal system of the other country. In addition, cultural problems appear when one is contemplating what to write down (and what not) in the contract. The appropriate business norms vary between cultures. For example, in the United Kingdom it is common to write down

every detail, while in other cultures, like the Dutch, it is customary to just write down the rough outline of the agreement and to fill in the details later, during the fulfilment of the agreement. These differences can lead to misunderstandings. Writing down all details creates a sphere of security in one case (the contract provides a solution for every problem that might occur), but it can also give a signal of distrust (why does the other party want to write down all these eventualities, does he foresee problems, doesn't he trust me?).

Cooray and Ratnatunga (2001) illustrate the problem in an interesting account of the troublesome co-operation between a Japanese customer and an Australian producer. They show how cultural differences lead to completely different perceptions about how to build a co-operative relationship. The Japanese buyer was focused on developing a long-term close relationship with his Australian partner, because it is customary in Japan to stay with a producer as long as the producer sells the product. It is a strategic decision with long-term consequences for a Japanese firm to choose a supplier. The Japanese therefore asked for much information about the quality and price of the product, and installed own personnel in the Australian firm, also because they are accustomed to co-operate with their producers to improve the product. The Australian firm however was not used to provide such detailed information about their production process and costs. A second problem arose, because the Australians wanted to develop the relationship along personal lines, while the Japanese counted on strict formal control and evaluation procedures. In the end, *alink-pin*, with knowledge of both cultures and companies, was hired to solve the mutual adjustment problems.

In general, striving for low contract transaction costs implies quick negotiations that result in a fair distribution of the rents.

The phase of *control* consists of the monitoring and enforcement of the contract. Both involve high transaction costs, especially at large distances. Monitoring means that business partners check whether the other party is doing what he promised to do. If the check turns out that this is not the case, the next step is enforcement of the contract. The most common solution for enforcement is to start a legal procedure. Especially in international trading relationships, this is often a troublesome affair. It takes time and money in large quantities and foreigners often feel being mistreated by prejudiced national courts when they file a claim against a national company. The outcome of the process can be quite uncertain. In general, there is the verification problem, which means that it is often very difficult or even impossible for third parties, like judges, to value the quality of the goods or services delivered. Country specific cultural values and norms also penetrate the national legal systems (see Bachmann 2001). In the United Kingdom, the law is commonly regarded as a device to protect the people from the government. The basic thought is that the government should not interfere in private matters. British judges therefore base their decisions in legal disputes extensively on what parties have voluntarily agreed on, even when power asymmetries might have influenced the voluntary element. In contrast the German and Dutch legal systems take the idea that contracts should be "reasonable" for both parties. The government is seen as a mechanism to correct injustices. German and Dutch judges therefore have and use the right to reinterpret and reconstruct contracts until their outcome can be considered "reasonable" for both parties. This means that two contracts with the same wordings can lead to different legal decisions, depending on the kind of legal system in the country in which the file is claimed.

Here, the control transaction costs can be held low in cases where the transaction partners comply to the terms of the agreement, so that there is no need for intensive monitoring nor legal enforcement.

Trust and transaction costs

Obviously, the transaction costs in the contact, contract and control phase are closely linked to the trust problem. The trust problem is at the core of finding reliable information about business opportunities, about potential business partners and about their trustworthiness (contact phase). Trust is also important when negotiating on how to split the rents and what (not) to put in the contract (contract phase), and it is a dominant factor at the decision on how and to what extent the agreement will be monitored and enforced (control phase).

In fact, in many circumstances trust between trading parties can be seen as a co-operative solution of a prisoners' dilemma where the trigger mechanism built in the repeated game does not completely exclude cheating. So placing trust is not a free lunch, there is a risk involved. That makes agents cautious to gather reliable information about potential business partners (contact), to carefully formulate the agreement (contract) and to adequately monitor and enforce it (control). What do people indulge to accept these risks and to trust the other, or how can this risk be contaminated so trust can develop? To answer this question, we distinguish two main types of trust generating mechanisms, respectively with a formal and an informal basis.

Trust mechanisms with a formal basis are the mechanisms that build trust that is, in the end, based on formal (legal) agreements and enforced by formal (legal) procedures. This "formal trust" is related to the rational choice concept of trust (Coleman 1990) and extrinsic motivation (Frey and Jegen 2001). Formal trust is closely linked to what is known by other authors as instrumental trust, rational trust, calculative trust (Williamson 1993), self-interested trust (Lyons and Mehta 1997), synthetic trust (Putnam 2000), fragile trust (Lindenberg 2000), narrow trust or egoistic trust (Nooteboom 2002) and, to some extent, system trust (Luhmann 1997, Bachmann 2001). All these notions of trust are related to each other, in the sense that they see this type of trust as being about the calculation of selfish interests in pecuniary terms. It takes the *homo economicus* view of mankind as its central perspective. It expects that people take into account all financial incentives involved, use a "rational way of thinking" and are not "hindered" by emotions. So, if it is profitable to cheat, one will cheat without remorse. People will act trustworthily when it pays to act trustworthily. The main idea of this approach is that the trust problem can be understood as a social co-ordination problem. To prevent that both players end up in the Nash equilibrium outcome of the prisoner's dilemma (both players playing the uncooperative or untrustworthy strategy), there are two solutions.

The first is to play the game an indefinite number of times. This allows reputation effects to emerge. Trustworthy behaviour in the past forms a valuable asset, because it enhances the chance of finding future business partners. The reputation mechanism works best, when the time horizon of the players is large, when there are many potential partners, and when information about past behaviour is easily accessible to all players. This forms an important reason why trading networks exist, as they fulfil these requirements. The second solution is to change the outcomes of the game in

such a way that it becomes favourable for the players to act in line with the agreement. On a bilateral level, this can be organised by promising bonuses for good compliance, or by taking “hostages” which are returned when the agreement has been fulfilled. Another way to invoke trustworthiness is by using intermediaries, for example banks that issue letters of credit. The most important way of solving the trust problem is of course by relying on the judicial power to enforce legal contracts. Threats of fines and imprisonment scare agents away from untrustworthy behaviour. So, according to this second solution a kind of contract, which is hopefully self-enforcing and prevents cheating, should preclude the traders to end up in the non-co-operative prisoner’s dilemma solution of no trade.

It should be noted that these trust mechanisms on a formal basis cannot take away all risk. In the first place, bounded rationality and incomplete information make it impossible to make all necessary calculations. Moreover, the behaviour of other people is guided by fundamental uncertainty called free will (Nooteboom 2002). Good prior intentions can always change when unforeseen circumstances occur. We already noted that legal contracts can be expensive, inherently incomplete, possibly unverifiable and subject to the particularities of the addressed legal system. On top of this, too much emphasis on formal trust might hurt informal trust. When relationships are guided by too much formal trust, based on extrinsic motivations, this can “crowd-out” informal trust which relies on intrinsic motivation (Tyler 1998; Ostrom 2000; Frey and Jegen 2001).

Trust mechanisms with an informal basis cover the relational and social-cultural mechanisms that build trust. Informal trust is based on intrinsic motivations (Frey 1993). This type of trust is closely related to the concepts of social trust, moral trust, personal or blind trust (Williamson 1993), socially-oriented trust (Lyons and Mehta 1997), resilient trust (Lindenberg 2000), broad or altruistic trust (Nooteboom 2002), generalised trust (Putnam 1993) and social capital (Fukuyama 1995). Both at the individual level and at the institutional level, there are a number of different mechanisms that generate informal trust.

At the individual level, the way in which people deal with uncertainty varies from person to person. Responsible for this is the extent of “ontological security” a person experiences (Giddens 1991). This has a direct influence on the individual “natural” level of trust in others, called “basic trust” (Giddens 1991) or “trusting impulse” (Stztompka 1999). In (bilateral) relationships, the problem of incomplete information is countered by the psychological mechanism of satisficing (Simon 1983). Agents collect and process information unto a certain aspiration level. When co-operation goes on for a while, a personal relationship develops between the contracting partners and custom and routine slip in. This is a rational way to deal with bounded rationality, because the limited processing capacity of the human brain is not distracted by operations that go well. When the relationship proceeds within certain “tolerance boundaries”, attention can be given to other problems (Nooteboom 2002). When these boundaries are crossed, the routine aspect of the trust relationship disappears and agents will pay close attention again to the relationship, collect information and possibly narrow the tolerance boundaries. When the relationship gets a very durable character, agents might reach the stage that they start to identify with each other and each others interests. This will first lead to making the relationship informally. Ethical and moral considerations start to rule the relationship. This can even lead to a

distortion of the perception of the trustworthiness of the other party. An example of this is cognitive dissonance. Contradictions between facts (about the behaviour of the other party) and beliefs (about the trustworthiness of the other party) give an uneasy feeling, which is solved by reinterpreting the facts in such a way that the beliefs can hold. Then the relationship can be called one of blind trust (Williamson 1985). Informal trust mechanisms are also active at a more collective level: in organisations, villages, cities, ethnic groups, networks and countries. In these groups, a trust culture might develop among its members. This is “a system of rules – norms and values – regulating granting trust and meeting, returning, and reciprocating trust; in short, rules about trust and trustworthiness” (Sztompka 1999: 99). If social control is effective, breaking such rules is followed by serious social sanctions.

The advantage of informal trust mechanisms above formal trust mechanisms is that one does not have to pay to keep afloat an entire legal system with its lawmakers, lawyers, judges and police. However, building informal trust can be a very difficult and lengthy process, especially when one wants to enter a group or network of which the membership ties are based on kinship, ethnicity, religiosity or place of birth. Examples of such closed trade network date from the Maghribi traders in the eleventh century (Greif 1989, 1993), the Jewish diamond merchants in the 1960s (Wechsberg 1966), to nowadays ethnic Chinese networks (Rauch and Trindade 2002).

Micro economic game experiments suggest that these informal forms of trust are relevant to explain human behaviour in economic situations. A common conclusion of those experiments – often shaped as social co-ordination problems – is that people are indeed inclined to behave trustingly and trustworthily (guided by norms as reciprocity and fairness), instead of playing the “rational” strategy of non co-operation. This result even holds true when high sums of money are at stake, when the participants are not students, and when no reputation effects can be built up (one-shot interaction with anonymous strangers); see Camerer and Thaler (1995), Berg, Dickhaut and McCabe (1995), Cameron (1999), Fehr and Gächter (2000) and Ostrom (2000).

The survey of the literature above provides insights in some general mechanisms, which govern the relationship between trade, transaction costs and trust. It gives rise to the following hypotheses to be tested in our empirical analysis where the focus is on the influence of problems of trust on (missing) trade:

1. Trust problems are a source of trade barriers and transaction costs. More trust means less trade barriers and less transaction costs. Thus, more trust leads to more trade.
2. Two types of trust can be distinguished: formal trust and informal trust. Both types are important in international trade.

We test these hypotheses in the next section and investigate whether our measurement of the influence of trust on trade flows is robust with respect to alternative models and indicators of trust.

3 Tests on trade, trust and transaction costs

Model and data

For testing the two above hypotheses, we use a gravity model framework. The main determinants of the model to explain the value of bilateral trade are the distance between the trading countries and their (economic) mass. The shorter the distance and the greater the GDP, the more trade will occur. This specification of the model has proven to be an effective tool for “explaining” about 60-80 percent of the variance in the volume of trade between countries (Bergstrand 1985, Frankel and Rose 2002). The gravity model of trade is generally considered to be a reduced form equation of which the structural model is unknown. However, Evenett and Keller (1998) have shown that the specification of the gravity model can be derived from the Heckscher-Ohlin model and/or from models with increasing returns to scale advantages of the new trade theory literature. The model is suitable for testing our hypotheses, since it easily allows for adding new variables to the basic framework. Often used additional variables – additional to distance and GDP – include GDP per capita (in combination with GDP, this is an implicit way of adding the variable population) and dummies for common language, sharing a border, access to sea, being an island, having a common (colonial) history and sharing the same currency (Bergstrand 1985, Frankel and Rose 2002, Rose 2000, Glick and Rose 2002, Rose 2002, Mélitz 2002, Loungani et al. 2002).

The theoretical argumentation of the previous section suggests that a higher level of trust leads to less transaction costs and consequently to more trade. However, we are unable to test directly whether trust problems lead to higher transaction costs, because we do not avail of data on the level of transaction costs. Even if we would know how many transaction costs are involved in all international transactions today, this would still be insufficient for our purpose. When, due to low levels of trust, transaction costs would be high, there would be no transactions at all, which is reflected in trade flow data but not in data on transaction costs. That is why the tests of our first hypothesis boil down to testing whether trade volumes are higher in cases in which trust problems are lower. Trust problems are lower when mutual trust is higher. Consequently we test our second hypothesis by distinguishing between indicators for formal and informal trust and their respective effects on the volume of trade.

As an indicator for formal trust, we use a dummy variable “formal trust” that is unity when the origins of the legal systems of two countries are similar, and is zero otherwise. A similar origin of the legal system makes it easier to contract and enforce the contract than when the legal systems of two countries differ, because major choices that can be made in the set-up of a legal system are corresponding. Sharing the origin of the legal system thus means a higher formal trust. The construction of our indicator for the origins of legal systems of countries is based on Zweigert and Kötz (1998) and La Porta et al. (1998). In our dataset of 25 countries, we distinguish five different systems. In addition to the four systems (French, German, English and Scandinavian) that are also distinguished by Zweigert and Kötz, and by La Porta et al., we add a fifth type for the former socialist countries, as the legal systems in these countries form a kind of their own after 45 years of communist governance (see table A3 in the appendix for an overview).

As an indicator for informal trust, we use the results of the EuroBarometer survey 46 (EB) held in 1996, of which one of the questions was: “I would like to ask you a question about how much trust you have in people from various countries. For each, please tell me whether you have a lot of trust, some trust, not very much trust or no trust at all?”.¹ In fact there are two types of data with respect to this question. The question has been answered by the inhabitants of the 15 EU-members in 1996 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Ireland, Spain, Sweden, Portugal and United Kingdom). However, the questionnaire did not only ask about the trust in these 15 EU-member states, it did also ask about trust in 10 additional countries (Czech Republic, Hungary, Japan, Norway, Poland, Russia, Slovak Republic, Switzerland, Turkey and United States). It means that we have more information about the 15 EU-countries than for the 10 additional ones. For all 25 countries, we know how much they are being trusted by the EU-countries. For the EU-countries, we also know how much they themselves trust the other 24 countries. We therefore created two different variables for informal trust. The first is “informal mutual trust”. This indicates the mutual informal trust and is computed as the product of the trust of country A in country B and the trust of country B in country A. This variable only exists for country pairs of two EU-countries. The second variable is called “informal average trust”. It is computed as the product of the average trust of the EU-countries in country A and the average trust of the EU-countries in country B. We avail of this variable for all country pairs.

These indicators for (informal) trust are different from the one that is often used in research on trust and social capital. For example Knack and Keefer (1997), La Porta et al. (1997) and Zak and Knack (2001) used the question on trust of the WorldValuesSurvey (WVS): “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?” We believe that the trust variable from the EB is, for our purpose of measuring the influence of trust on trade, more adequate since it directly indicates how inhabitants of various countries do trust each other. The trust variable from the WVS measures trust in a far more general way and is more an indicator for trust in (strangers in) one’s own country.

For all other data for the gravity model (value of bilateral trade, distance, GDP, control variables) we use a data set constructed by Rose (2002).² Table A1 and A2 in the appendix provide lists of all variables and sources.

Figure 1 illustrates some characteristics of the indicators for informal trust in our analysis. The, on average, most trusted countries are Switzerland and the Scandinavian countries, the least trusted are Turkey and the East-European countries. The trust of a country in other countries goes hand in hand with being trusted by other countries: “do well and have well”.³ Only Sweden and Ireland seem to trust other

¹ We calculated means by applying the coefficient four, three, two and one respectively to the various answer codes; “no reply” answers have been excluded from the calculation. The mid point is then two-and-a-half. Below this level, the negative answers predominate and above, the positive ones.

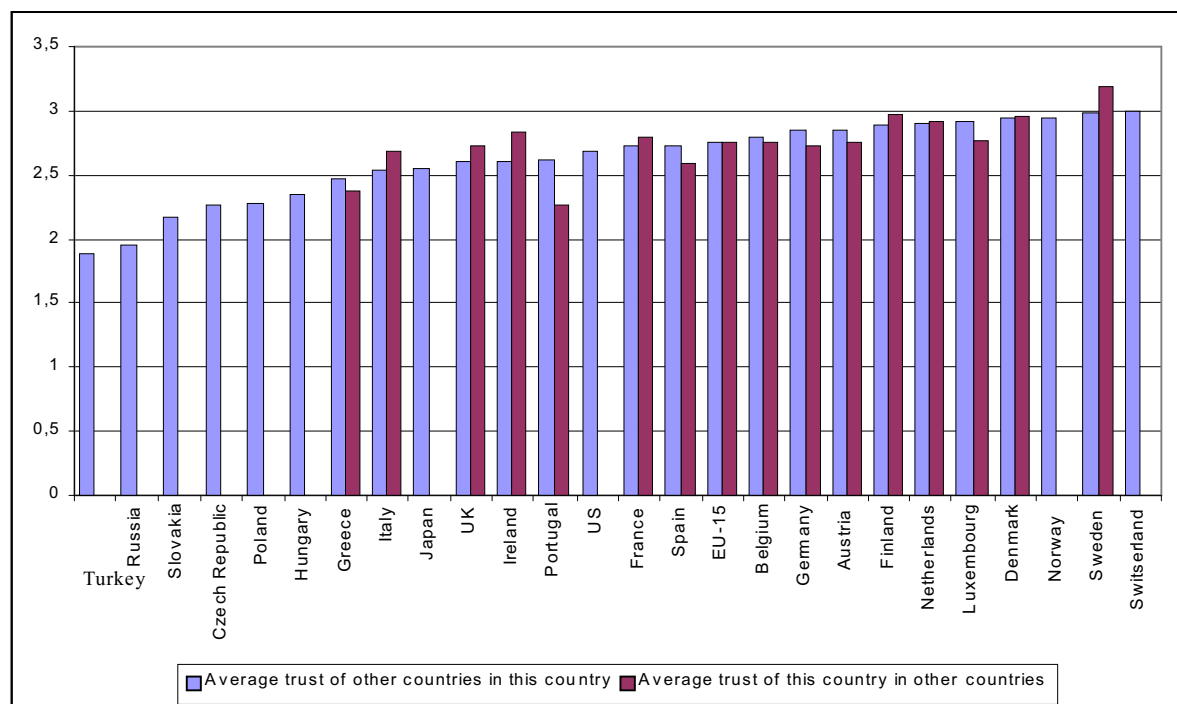
² We are highly indebted to Rose for being able to use his data set, which can be found on his website.

³ The correlation of 0.7 is significant at the 0.01 level.

countries somewhat more than they are themselves trusted, while the opposite is true for Portugal.

To get a better feeling for the differences in trust, we note that the spread in the product of mutual trust (“informal mutual trust”) is 7.17, ranging from relatively high mutual trust between Denmark and Sweden (12.21) to relatively low mutual trust between Germany and Greece (5.04). See table A3 in the appendix for summary statistics on “informal mutual trust” and “informal average trust”.

Figure 1. Average trust in other countries by a specific country and average trust in a specific country by other countries, in 1996.



Source: EuroBarometer survey 46, 1996.

Basic results

We start our empirical analysis with estimating simple regression specifications where, in addition to the usual explanatory variables of gravity equations, the indicators for formal trust (“formal trust”) and informal trust (“informal mutual trust”) are included to explain bilateral trade flows in 1996 as year of observation. The results are reported in Table 1. The indicators for formal trust and informal trust are both significant and do explain a substantial part of bilateral trade flows. The coefficient of the dummy variable for a similar legal system varies between 0.38 and 0.61. This means that country-pairs with a similar legal systems trade some 46 to 84 percent more with each other than countries with a different system.⁴ The fact that both indicators for trust obtain significant positive coefficients when included together in the equation indicates that both types of trust distinguished in this paper are of importance in international trade. It also indicates that the two variables represent different phenomena; they are not the same. The coefficient of the indicator of informal trust (with values ranging between 0.13 and 0.18) indicates that a change of mutual informal trust of the size of a standard deviation leads to a change of 24 to 34

⁴ $(e^{(0.38)} - 1) * 100 = 46$.

percent in trade volume.⁵ The combined effects of formal and informal trust add up to a 70 to 118 percent change in bilateral trade, depending on the legal system and a difference of a standard deviation in informal trust. So we conclude that these first results strongly corroborate our hypotheses on the relationship between trust and trade.

Table 1. Estimation results for simple gravity equations explaining bilateral trade flows in 1996 with additional indicators for formal and informal trust.

Dependent: value of bilateral trade.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distance	-1.05 (0.10)	-0.85 (0.09)	-0.75 (0.08)	-0.93 (0.10)	-0.70 (0.09)	-0.86 (0.09)	-0.69 (0.08)
GDP	0.75 (0.03)	0.80 (0.03)	0.82 (0.03)	0.71 (0.03)	0.68 (0.03)	0.82 (0.04)	0.77 (0.04)
GDP per capita				0.54 (0.16)	0.99 (0.16)	-0.11 (0.20)	0.42 (0.20)
Formal trust			0.38 (0.09)		0.61 (0.11)		0.50 (0.10)
Informal mutual trust		0.16 (0.03)	0.18 (0.02)			0.18 (0.04)	0.13 (0.03)
Year	1996	1996	1996	1996	1996	1996	1996
Number of obs.	78	78	78	78	78	78	78
Adj. R2	0.92	0.95	0.96	0.93	0.95	0.95	0.96
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Standard errors in parentheses. Intercept not reported.

With these estimation results of our basic specification as a starting point we investigate the robustness of these result by considering alternative specifications of the model and by applying different estimation methods. We start by changing the indicator of informal trust where we now use the indicator for total average trust (“informal average trust”) instead of the indicator for mutual trust, which we would prefer from an economic point of view. Inclusion of this indicator in our specification allows us to use a larger data set where we have 231 observations (for 25 countries) instead of 78 observations (for 15 countries). Table 2 gives the estimation results for this alternative indicator for informal trust. With this broader dataset, we see that the coefficient for formal trust, “formal trust”, is on average somewhat higher than in our basic estimation results of table 1. The effects of the alternative indicator for informal trust are also somewhat larger than the influence of the previous indicator.⁶ These differences can be easily explained when we realise that the legal and cultural differences between the 15 EU-countries are relatively smaller than between the 25 EU and non-EU countries.

⁵ $1.71 * (e^{(0.13)} - 1) * 100 = 24$.

⁶ The estimation result in column 4 of Table 2 could be understood as follows. An increase of informal trust by one standard deviation leads to a rise in bilateral trade of 69 percent.

Table 2. Estimation results for gravity equations explaining bilateral trade flows in 1996 with an alternative indicator for informal trust.

Dependent: value of bilateral trade.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distance	-1.13 (0.07)	-1.07 (0.07)	-1.01 (0.05)	-0.93 (0.05)	-1.07 (0.05)	-0.99 (0.05)	-1.04 (0.05)	-0.96 (0.05)
GDP	0.95 (0.03)	0.94 (0.03)	0.89 (0.02)	0.87 (0.02)	0.78 (0.03)	0.75 (0.03)	0.83 (0.03)	0.80 (0.03)
GDP per capita					0.81 (0.06)	0.84 (0.06)	0.45 (0.16)	0.50 (0.15)
Formal trust		0.46 (0.14)		0.58 (0.10)		0.60 (0.10)		0.60 (0.10)
Informal average trust			0.48 (0.04)	0.50 (0.04)			0.23 (0.10)	0.22 (0.09)
Year	1996	1996	1996	1996	1996	1996	1996	1996
Number of obs.	231	231	231	231	231	231	231	231
Adj. R2	0.81	0.82	0.89	0.90	0.89	0.90	0.89	0.90
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Standard errors in parentheses. Intercept not reported.

Time series for trade

The relatively small data set used in the regressions so far has two major disadvantages. The first is that it has too little observations to include the often used control variables, for example for countries that share a border or a language, countries that have no direct access to sea or are surrounded by water. The second disadvantage is that world trade can be very sensible to variations in world economic growth (e.g. recession in the beginning of the nineties), monetary problems (e.g. Mexican peso-crisis, banking crises and other financial problems in East Asia and Russia in 1998) and political turmoil (e.g. Gulf War). Although 1996 was largely free of such major events, as yet it is appropriate to investigate the robustness of the estimation results when a larger time span is considered. We therefore extend the analysis by using a time series of yearly data on bilateral trade flows for the seven-year period (1993-1999). This also solves the problem of the little number of observations, so that we are able to add several control variables. But it creates a problem in the sense that we only have data on informal trust for 1996. By enlarging the time-span, we thus implicitly assume that informal trust is constant for the three years preceding and the three years following the year 1996.

The estimation results for the period 1993-1999 are given in table 3. The indicators for informal trust all obtain positive and significant coefficient values, ranging from 0.18 to 0.71. The coefficient of the indicator for formal trust is somewhat less significant if combined with the original indicator of mutual informal trust but fairly significant if combined with the indicator for average informal trust. The extension of the time span to seven years and the inclusion of several control variables (including year controls) do not alter the conclusions about formal and informal trust from our basic specifications. Both indicators still contribute to the explanation of trade and even seem to outperform as explanatory variables for trade the control variables usually found in other studies. In our estimations we find that the coefficient values of these traditional control variables are hardly significant, with the dummy for

landlocked countries – countries which have no direct access to sea – as an exception. For example, high mutual trust appears to be more important than sharing the same language, which is in contrast with the studies of Frankel and Rose (2002) and Mélitz (2002). An explanation for this result might be that our dataset consists of countries with a relatively highly educated population, probably also in the field of foreign languages. Apparently, differences in (native) languages do not form a serious problem then. But even when communication is not bothered by language problems, the trust problem is still present for these countries. In other words, a language can be learned, but trust has to be earned.

Table 3. Estimation results for gravity equations explaining bilateral trade flows in the period 1993-1999.

Dependent: value of bilateral trade.

	(1)	(2)	(3)	(4)
Distance	-1.19 (0.14)	-0.89 (0.11)	-1.10 (0.09)	-0.92 (0.08)
GDP	0.66 (0.05)	0.82 (0.04)	0.74 (0.03)	0.87 (0.04)
GDP per capita	0.21 (0.13)	-0.25 (0.15)	0.27 (0.06)	-0.53 (0.10)
Land area	0.17 (0.05)	0.03 (0.05)	0.15 (0.04)	0.07 (0.04)
Landlocked	-0.73 (0.12)	-0.61 (0.09)	-0.26 (0.09)	-0.17 (0.09)
Island			0.34 (0.22)	0.36 (0.22)
Common border	-0.08 (0.17)	0.12 (0.16)	0.34 (0.20)	0.28 (0.19)
Common language	0.25 (0.22)	0.12 (0.21)	0.21 (0.15)	0.09 (0.17)
Formal trust		0.16 (0.09)		0.43 (0.10)
Informal mutual trust		0.18 (0.03)		
Informal average trust				0.71 (0.07)
Year	1993-1999	1993-1999	1993-1999	1993-1999
Number of obs.	627	627	1800	1800
Adj. R2	0.94	0.95	0.84	0.88
Method	OLS	OLS	OLS	OLS

Standard errors robust to country-pair clustering recorded in parentheses.
Intercept and year controls not reported.

A further look into the dynamics of trust and trade

As noted above, by extending the estimation period to seven years, we implicitly assume that informal trust is constant over this period, although it is only measured in 1996. To test whether this assumption is plausible, we repeat our regressions for two subperiods, namely 1993 to 1995, and 1997 to 1999; Table 4 gives the results. A comparison of column (2) with (3) and of column (5) with (6) suggests that the assumption of constant trust is quite heroic. Trust seems to have far more explanatory power for trade in the three years after 1996, than for trade in the three years before 1996. These results also give a clue about how causality runs between trust and trade.

In general, it can be argued that higher trust leads to more trade, but also that more (successful) trade will lead to higher trust. As we find that a given level for informal trust is better able to explain future trade than past trade, this strongly suggests that causality runs from trust to trade. We note that Knack and Keefer (1997) applied a similar methodology in order to test whether trust leads to economic wealth, instead of the other way around.

These estimation results for two subperiods also reveal a second dynamic effect, namely a trade-off between formal and informal trust. When informal trust rises in importance, formal trust becomes less relevant. This substitution effect between formal and informal trust is closely related to the substitution effect between extrinsic and intrinsic motivations (Frey and Jegen 2001).

Table 4. Estimation results for gravity equations explaining the dynamics between bilateral trade flows and trust.

Dependent: value of bilateral trade						
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	-0.92 (0.08)	-1.00 (0.09)	-0.90 (0.08)	-0.89 (0.11)	-0.78 (0.11)	-0.96 (0.13)
GDP	0.87 (0.04)	0.75 (0.05)	0.88 (0.04)	0.82 (0.04)	0.67 (0.04)	0.82 (0.05)
GDP per capita	-0.53 (0.10)	0.58 (0.19)	-0.54 (0.09)	-0.25 (0.15)	0.67 (0.21)	-0.34 (0.16)
Land area	0.07 (0.04)	0.03 (0.05)	0.07 (0.04)	0.03 (0.05)	0.02 (0.05)	0.04 (0.05)
Landlocked	-0.17 (0.09)	-0.07 (0.10)	-0.17 (0.08)	-0.61 (0.09)	-0.46 (0.08)	-0.70 (0.11)
Island	0.36 (0.22)	0.40 (0.22)	0.11 (0.22)			
Common border	0.28 (0.19)	0.20 (0.21)	0.31 (0.18)	0.12 (0.16)	0.10 (0.15)	0.15 (0.18)
Common language	0.09 (0.17)	-0.14 (0.17)	0.07 (0.16)	0.12 (0.21)	-0.00 (0.20)	0.05 (0.21)
Formal trust	0.43 (0.10)	0.55 (0.11)	0.40 (0.10)	0.16 (0.09)	0.39 (0.09)	0.16 (0.09)
Informal mutual trust				0.18 (0.03)	0.09 (0.03)	0.18 (0.04)
Informal average trust	0.71 (0.07)	0.23 (0.10)	0.58 (0.07)			
Year	1993-1999	1993-1995	1997-1999	1993-1999	1993-1995	1997-1999
Number of obs.	1800	924	876	627	234	315
R2	0.88	0.91	0.88	0.95	0.97	0.95
Method	OLS	OLS	OLS	OLS	OLS	OLS

Standard errors robust to country-pair clustering recorded in parentheses. Intercept and year controls not reported.

Robustness tests using other estimation methods

Up to now we have used simple OLS regressions to establish the relationship between trust and trade. Here two problems arise. The first is the problem of simultaneity because some of the explanatory variables probably are not fully exogenous. As GDP and GDP per capita (or population) are commonly used in gravity model estimations and simultaneity problems with respect to these variables have been amply discussed

(see e.g. Frankel and Rose, 2000), we disregard these problems here. Therefore we focus on possible simultaneity problems in the relation between trust and trade. As we have seen above, there are some comforting indications that causality runs from trust to trade.

The second potential problem stems from unobserved characteristics of country-pairs that influence their trading behaviour. In the OLS estimations above, we tried to circumvent this problem by using the cluster function, which generates robust standard errors. A more general solution to address these problems is to use a fixed effect estimator. However, this is not a viable option here, because almost all relevant variables (formal trust, informal trust, distance, landlocked, island, common border, common language) are time invariant and can therefore not be estimated in a fixed effect estimation procedure.

As yet, there are two other solutions. The first is by using a random effects regression model, the second is by using instrument variables. The results of the random effects Generalised Least Squares model estimation are given in table 5. Here we obtain estimation results that are somewhat different from the results reported above. The coefficient for both indicators of informal trust are positively significant, but is rather large (1.09) for average informal trust. This would imply a rise in trade of 215 percent when informal trust rises, according to this indicator, with an impulse of one standard deviation. Moreover, the coefficient of formal trust appears to be no longer significant when combined with the other indicator of informal trust, “informal mutual trust”.

Table 5. Estimation results for gravity equations explaining bilateral trade flows using a random effects model.

Dependent: value of bilateral trade.

	(1)	(2)	(3)
Distance	-1.01 (0.10)	-0.77 (0.08)	-0.93 (0.15)
GDP	0.67 (0.05)	0.92 (0.04)	0.89 (0.06)
GDP per capita	-0.70 (0.05)	-1.10 (0.04)	-0.85 (0.08)
Land area	-0.02 (0.05)	0.02 (0.04)	-0.03 (0.06)
Landlocked	-0.91 (0.09)	-0.22 (0.08)	-0.56 (0.12)
Island	0.90 (0.25)	0.38 (0.20)	
Common border	0.41 (0.20)	0.39 (0.17)	0.27 (0.19)
Common language	1.17 (0.23)	0.16 (0.19)	0.02 (0.18)
Formal trust		0.44 (0.10)	0.06 (0.10)
Informal mutual trust			0.27 (0.04)
Informal average trust		1.09 (0.04)	
Year	1993-1999	1993-1999	1993-1999
Number of obs.	1800	1800	627
R2 within	0.48	0.50	0.55
R2 between	0.63	0.87	0.95
R2 overall	0.60	0.86	0.95
Method	RE GLS	RE GLS	RE GLS

Standard errors robust to country-pair clustering recorded in parentheses.

Intercept and year controls not reported.

We proceed by exploring the second alternative for testing possible endogeneity problems with respect to the indicators for informal trust using the Two Stages Least Squares method. As an instrument we choose the trust variable from the WorldValuesSurvey. This variable can be considered as the amount of trust people have in other inhabitants of their own country. Although there seems to be no theoretical ground for assuming a direct relationship between the extent to which people trust their own countrymen and international trade it appears that this variable is correlated to trust in inhabitants of other countries; probably, it can be seen as a form of a basic level of trust in foreigners. We calculated correlation coefficients between this indicator for trust and the two indicators for informal trust (“informal mutual trust” and “informal average trust”) of respectively 0.78 and 0.67 for 1996. To compute the variable, we took the results from the WVS held in the years 1995-1997. If a country was not included in that sample, we took the results from the WVS held in 1990-1993. Only two countries, Luxembourg and Greece, were absent in both surveys. Table 6 shows the estimation results for 1996, the period 1993-1999 and two subperiods of three years. The coefficient value for “formal trust” varies between 0.28 and 0.61 and the coefficient value for “informal mutual trust” varies between 0.13 and

0.33. This is rather in line with the sizes of the coefficients found in the simple OLS estimates. However, the coefficient for “informal average trust” is relatively high, ranging from 1.03 to 1.66. This is clearly larger than the OLS results. Hausman tests on endogeneity suggest that both indicators for informal trust are indeed endogenous, both in 1996 and for the seven-year period 1993-1999, with an exception for “informal mutual trust” in 1993-1999. This (mixed) result means that we have to be very careful in interpreting the estimation results of the OLS and random effects estimations. Therefore, we prefer the IV estimation results, although it is remarkable to notice that the IV estimation results for the coefficients of the informal trust variables are close to or even higher than the OLS and RE estimation results.⁷ A similar resemblance with the OLS results can be found in the dynamics of trust and trade. The indicators for informal trust are higher in 1996 and the period after, than in the period before 1996, and there seems to be a substitution effect between formal trust and informal trust.

⁷ Although it might be counterintuitive that the IV-estimates for the supposed endogenous variable are higher than the OLS-estimates, it is not an exceptional result; see for example the literature on education and earnings where IV-estimates are commonly found to be higher than OLS-estimates (Card 1999).

Table 6. Estimation results for gravity equations explaining bilateral trade flows using 2SLS.

Dependent: value of bilateral trade.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distance	-0.69 (0.10)	-0.73 (0.14)	-0.75 (0.13)	-0.78 (0.15)	-0.74 (0.12)	-0.74 (0.11)	-0.87 (0.13)	-0.64 (0.11)
GDP	0.91 (0.07)	0.83 (0.06)	0.72 (0.07)	0.84 (0.07)	1.08 (0.14)	0.98 (0.05)	0.92 (0.09)	0.97 (0.05)
GDP per capita	-0.70 (0.43)	-0.47 (0.20)	0.20 (0.29)	-0.65 (0.24)	1.75 (1.05)	-1.31 (0.23)	-0.68 (0.62)	-1.37 (0.24)
Land area		-0.03 (0.05)	-0.01 (0.05)	-0.03 (0.06)		-0.02 (0.05)	0.01 (0.06)	-0.04 (0.05)
Landlocked		-0.46 (0.08)	-0.42 (0.08)	-0.53 (0.09)		-0.17 (0.11)	-0.14 (0.11)	-0.15 (0.11)
Island						0.37 (0.27)	0.51 (0.27)	0.24 (0.27)
Common border		0.15 (0.17)	0.10 (0.16)	0.11 (0.19)		0.34 (0.23)	0.29 (0.25)	0.35 (0.21)
Common language		0.05 (0.21)	-0.01 (0.19)	0.09 (0.21)		0.05 (0.23)	0.01 (0.21)	0.04 (0.22)
Formal trust	0.39 (0.15)	0.32 (0.08)	0.43 (0.08)	0.28 (0.08)	0.61 (0.16)	0.52 (0.13)	0.54 (0.13)	0.52 (0.12)
Informal mutual trust	0.33 (0.09)	0.22 (0.06)	0.13 (0.07)	0.23 (0.08)				
Informal average trust					1.66 (0.68)	1.37 (0.19)	1.03 (0.38)	1.42 (0.23)
Year	1996	1993-1999	1993-1995	1997-1999	1996	1993-1999	1993-1995	1997-1999
Number of obs.	66	498	198	234	210	1577	630	737
R2	0.94	0.96	0.97	0.95	0.80	0.83	0.88	0.80
Method	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)

Standard errors robust to country-pair clustering recorded in parentheses. Intercept and year controls not reported. Instrumented: informal average trust / informal mutual trust. Instruments: WVS trust and all exogenous variables.

4 Concluding remarks

Our empirical investigation above shows that both indicators for formal trust and informal trust obtain significant and positive coefficient values and contribute to a substantial extent to the explanation of bilateral trade flows. Our extensive analysis of alternative specifications and estimation methods suggests that these estimation results are quite robust indeed, and that causality runs from trust to trade (although we cannot exclude some recursive causality from trade to trust). The results are also robust when possible outliers like Japan and the United States (both at a large distance from Europe, the US are an exceptionally big country in our data set) are removed from the data set (as we found in estimations not reported here). It is interesting to note that we find such substantial influence of the two types of trust on trade flows, considering the fact that the countries in our dataset, especially the EU-countries, are all more or less highly developed, share many similar cultural characteristics and have closed many bilateral and multilateral legal agreements. It would not surprise us if the results would be even much stronger, when we would have availed of a dataset including a greater variety of countries, less developed and/or with a less strong Western orientation.

How do these findings relate to the mystery of the missing trade? For different periods and for different estimation methods, the estimated coefficient values for formal trust cluster around 0.40, with a highest value of 0.61 and a lowest of 0.16. In almost all specifications this coefficient value is highly significant. A coefficient value of 0.40 means that country-pairs which have a similar origin of their legal systems trade almost 50 percent more with each other than other country-pairs. For the coefficient of mutual informal trust we found values in the range of 0.16 to 0.33. When we take a coefficient value of 0.20 it means that a rise in mutual trust by one standard deviation leads to an increase in trade of almost 40 percent. This effect is even higher when we take the alternative indicator for informal trust, “informal average trust”. From a theoretical perspective this indicator is less informative than “informal mutual trust” because it is based on average instead of bilateral trust, but from an empirical perspective it is more informative because it can be used in estimates for a broader range of countries. Here we found a somewhat larger range of coefficient values in our specifications with a lowest value of 0.22 and a highest of 1.66. A value of 0.70, which is almost in the middle of this range, would imply a rise in bilateral trade of more than 100 percent when “informal average trust” would be enhanced by one standard deviation. The combined effects of formal and informal trust described above add up to a 90-150 percent change in bilateral trade.

In order to provide some more insight in the order of magnitude of the influence of trust on bilateral trade flows, we compare, by way of a concrete albeit extreme example, the country-pair Germany-Greece with Denmark-Sweden. Denmark-Sweden is the country-pair with the best trust relationship in our dataset, whereas the trust between Germany and Greece is the lowest in the dataset. Our estimation results indicate that trust problems between Germany and Greece are responsible for “missing trade” between these countries in the order of some 216 percent of the actual value of bilateral trade. Germany and Greece do not share a legal system like Denmark and Sweden do (accounting for 49 percent) and their mutual informal trust is much lower than between Denmark and Sweden (accounting for 167 percent). It does, by the way, not imply that there are no trust problems between Denmark and Sweden. Although their mutual informal trust is rather high, there is still ample room for a rise that would further enhance bilateral trade between these countries. The similar origin of the legal systems in these two Scandinavian countries does not guarantee the exclusion of all possible legal controversies. Clearly, case study evidence and a detailed analysis of legal and cultural differences is needed in order to derive more sophisticated indicators for both formal and informal trust. It would provide us with further evidence on the main empirical finding of this paper, namely that a considerable part of missing trade can be attributed to a relative lack of trust. More mutual trust between nations and traders would lead to lower transaction costs and would, therefore enhance trade and welfare.

Obviously, trust formation in trade relationships brings about positive externalities. Therefore, trust between countries partly has the character of a public good. Although our findings are largely based on a static analysis, they strongly suggest that government agencies for trade promotion should be alert on mitigating transaction costs that come forth out of trust problems (also see Wetenschappelijke Raad voor het Regeringsbeleid, 2003). This implies policies that ease the settlement of international legal disputes, that encourage reputation building, that increase the traders’ knowledge of other cultures, that strengthen the traders’ capabilities to speak foreign

languages, etc. These policy implications require special attention in this era of globalisation and the developments in information and communication technologies. In fact, globalisation and the ICT-revolution enhance the possibilities to trade with faraway foreign countries by diminishing tariff barriers, transport costs and communication costs, which undoubtedly leads to a surge in trust problems. Especially reputations become more important as information about past performances will be available to a larger public through the Internet. ICT can, however, never form a true replacement for all personal contacts. Face to face contact will remain essential to develop mutual trust and keep the trade going.

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Annex. Data sources and definitions.

Datasets

- For the data on trust between countries, “informal mutual trust” and “informal average trust”, we used:

Melich, A.

European Commission * Brussels, Belgium

Eurobarometer 46.0 1996 [computer file]

Amsterdam, Steinmetz-archief (P1337)

- For the data on trust within countries, “WVS trust”, we used:

Inglehart, Ronald, et al.

World Values Surveys 1990-1993 and 1995-1997 [computer file]

Amsterdam, Steinmetz-archief

- For all other data, we used:

the dataset constructed by Rose (2002), which can be found at his website:

<http://faculty.haas.berkeley.edu/arose/>.

Table A1. Explanation of variables used in the gravity equation.

Value of bilateral trade	Log value of bilateral trade in real \$
Distance	Log of distance
GDP	Log of product of real GDPs
GDP per capita	Log of product of real GDPs per capita
Land area	Log of product of land areas
Landlocked	Number of countries that are landlocked (0/1/2)
Island	Number of countries that are an island (0/1/2)
Common border	1 if countries share a land border
Common language	1 for common language
Formal trust	1 for common legal system
Informal mutual trust	Product of mutual trust (only for the 15 EU-countries)
Informal average trust	Product of average trust in the countries (for all 25 countries)
WVS trust	Product of WVS trust (for 23 countries)

Table A2. Summary statistics of informal mutual trust and informal average trust.

	Year	Observations	Mean	Standard deviation	Minimum	Maximum
Informal mutual trust	1996	78	7.53	1.71	5.04	12.21
Informal mutual trust	1993-1999	627	7.58	1.65	5.04	12.21
Informal average trust	1996	231	6.90	1.07	4.08	8.97
Informal average trust	1993-1999	1800	6.90	1.09	3.68	8.97

Table A3. Countries in the dataset.

Country	EU-member	Dataset 93-99?	WVS session	Origin of legal system
Austria	Yes	Full period	1990-1993	German
Belgium	Yes	1997-1999	1990-1993	French
Czech Republic	No	Full period	1990-1993	Former socialist
Denmark	Yes	Full period	1990-1993	Scandinavian
Finland	Yes	Full period	1995-1997	Scandinavian
France	Yes	Full period	1990-1993	French
Germany	Yes	Full period	1995-1997	German
Greece	Yes	Full period	Na	French
Hungary	No	Full period	1990-1993	Former socialist
Ireland	Yes	Full period	1990-1993	English
Italy	Yes	Full period	1990-1993	French
Japan	No	Full period	1995-1997	German
Luxembourg	Yes	1997-1999	Na	French
Netherlands	Yes	Full period	1990-1993	French
Norway	No	Full period	1995-1997	Scandinavian
Poland	No	Full period	1995-1997	Former socialist
Portugal	Yes	Full period	1990-1993	French
Russia	No	1998-1999	1995-1997	Former socialist
Slovak Republic	No	Full period	1990-1993	Former socialist
Spain	Yes	Full period	1995-1997	French
Sweden	Yes	Full period	1995-1997	Scandinavian
Switzerland	No	Full period	1995-1997	German
Turkey	No	Full period	1995-1997	French
United Kingdom	Yes	Full period	1995-1997	English
United States	No	Full period	1995-1997	English